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## I CLAIM:

1. A method of producing heat energy, comprising the steps of:  
providing a container for receiving an electrolyte composition, a cathode and an anode;  
forming an electrolyte composition comprising D<sub>2</sub>O and an ionizable acid;  
5 placing a sufficient amount of the electrolyte composition in the container to at least  
partially cover a cathode made from a metal selected from the group consisting of nonhydride  
forming metals and to at least partially cover an inert anode situated inside the container;  
connecting the cathode and anode to a source of electricity; and  
applying a voltage across the cathode and anode.  
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2. The method according to claim 1 wherein the cathode is made from a metal selected  
from the group consisting of palladium, platinum and titanium.
3. The method of claim 1 wherein the electrolyte during the application of voltage is  
15 held within a container and wherein said container bounds a space above the electrolyte, said  
space providing a region for the recombining of gases produced during the electrolysis.
4. The method of claim 1 wherein a catalyst is provided within said region catalyzing  
the recombining of gases produced by the electrolysis.  
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5. The method according to claim 1 wherein the cathode is made from palladium.
6. The method according to claim 5 wherein the size of the cathode is about 1 cm<sup>2</sup>.
- 25 7. The method according to claim 1 wherein the cathode is made from titanium.
8. The method according to claim 1 wherein the inert anode is a platinum anode.
9. The method according to claim 1 wherein the electrolyte composition consists  
30 essentially of D<sub>2</sub>O and about 15% sulfuric acid by volume.

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10. The method according to claim 9 wherein the cathode is made from palladium or titanium.

5           11. A method of producing heat energy, comprising the steps of:  
          providing a container for receiving an electrolyte composition, a cathode and an anode;  
          forming an electrolyte composition comprising D<sub>2</sub>O and sulfuric acid;  
          placing a sufficient amount of the electrolyte composition in a container to at least  
partially cover a cathode made from a metal selected from the group consisting of nonhydride  
forming metals and to at least partially cover an inert anode situated inside the container;  
10          connecting said cathode and anode to a source of electricity; and  
          applying a voltage of about 3.5 volts across the cathode and anode.

          12. A method of producing heat energy, comprising the steps of:  
          providing a container for receiving an electrolyte composition, a cathode and an anode;  
15          forming an electrolyte composition consisting essentially of D<sub>2</sub>O and 15% by volume  
sulfuric acid;  
          placing a sufficient amount of the electrolyte composition in a container to at least  
partially cover a palladium or titanium cathode and an inert anode situated inside the container,  
wherein the container bounds a space above said electrolyte composition;  
20          connecting said cathode and anode to a source of electricity;  
          applying a voltage across the cathode and anode; and  
          providing a catalyst within the space above the electrolyte composition to catalyze the  
recombination of gases produced by the electrolyte.